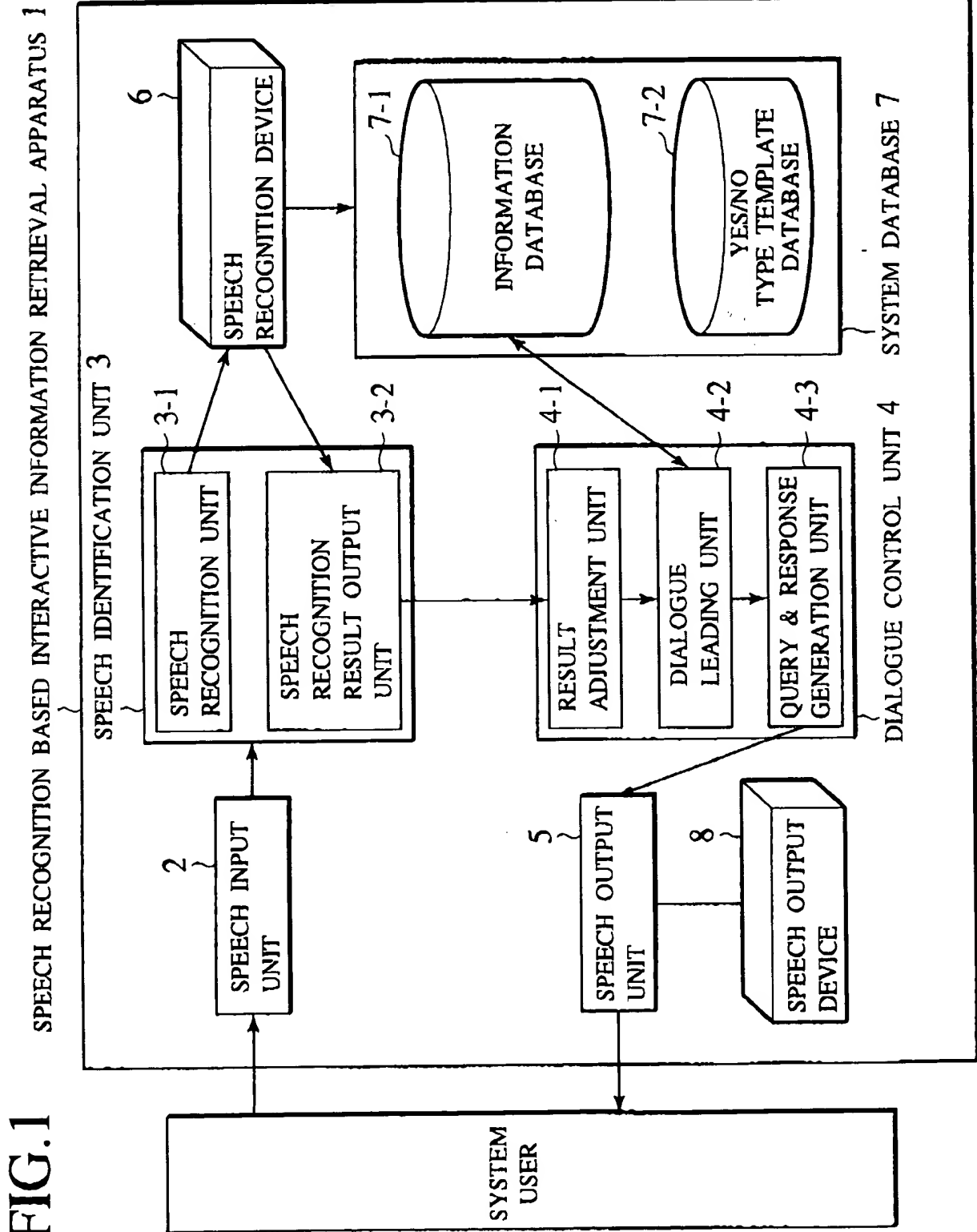


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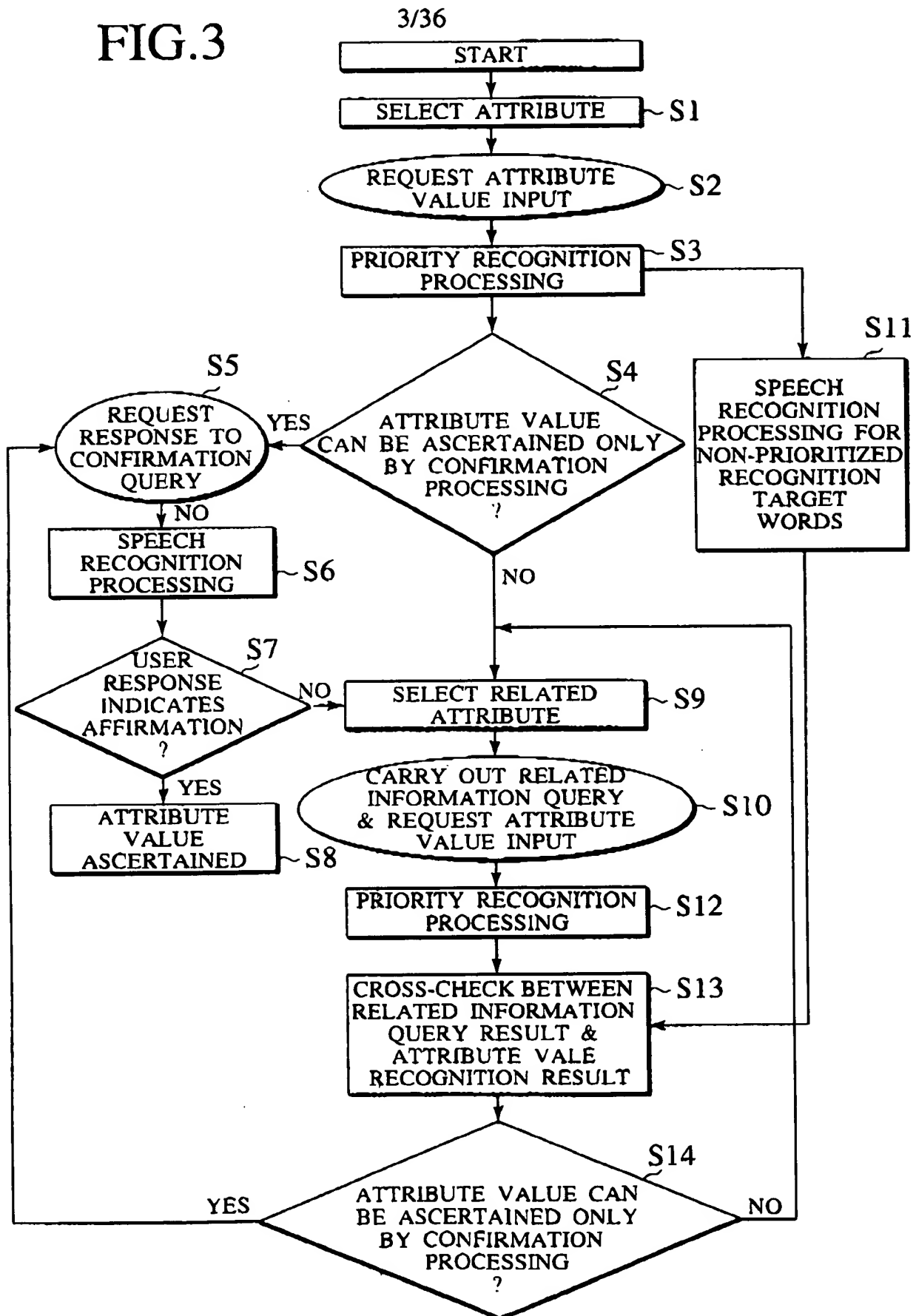


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FIG.2

ATTRIBUTE VALUES OF ATTRIBUTE #1	ATTRIBUTE VALUES OF ATTRIBUTE #2	---	ATTRIBUTE VALUES OF ATTRIBUTE # $\alpha$
ATTRIBUTE VALUE #1 <sub>1</sub>	ATTRIBUTE VALUE #2 <sub>1</sub>	---	ATTRIBUTE VALUE # $\alpha_1$
ATTRIBUTE VALUE #1 <sub>j</sub>	ATTRIBUTE VALUE #2 <sub>1</sub>	---	ATTRIBUTE VALUE # $\alpha_2$
ATTRIBUTE VALUE #1 <sub>j</sub>	:	---	ATTRIBUTE VALUE # $\alpha_3$
ATTRIBUTE VALUE #1 <sub>1</sub>	ATTRIBUTE VALUE #2 <sub>1</sub>	---	ATTRIBUTE VALUE # $\alpha_4$
:	ATTRIBUTE VALUE #2 <sub>2</sub>	---	:
:	:	---	:
:	ATTRIBUTE VALUE #2 <sub>3</sub>	---	:
ATTRIBUTE VALUE #1 <sub>1</sub>	:	---	:
ATTRIBUTE VALUE #1 <sub>2</sub>	ATTRIBUTE VALUE #2 <sub>1</sub>	---	:
ATTRIBUTE VALUE #1 <sub>2</sub>	:	---	:
:	ATTRIBUTE VALUE #2 <sub>j</sub>	---	:
:	:	---	:
ATTRIBUTE VALUE #1 <sub>2</sub>	:	---	:
ATTRIBUTE VALUE #1 <sub>3</sub>	ATTRIBUTE VALUE #2 <sub>1</sub>	---	:
:	:	---	:
ATTRIBUTE VALUE #1 <sub>3</sub>	:	---	:
:	:	---	:
:	:	---	:
:	:	---	:
:	:	---	:
ATTRIBUTE VALUE #1 <sub>n</sub>	:	---	:
ATTRIBUTE VALUE #1 <sub>n</sub>	:	---	:
:	ATTRIBUTE VALUE #2 <sub>p</sub>	---	:
ATTRIBUTE VALUE #1 <sub>n</sub>	ATTRIBUTE VALUE #2 <sub>p</sub>	---	ATTRIBUTE VALUE # $\alpha_2$

FIG.3



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FIG.4

ATTRIBUTE VALUES OF ATTRIBUTE #1 (PREFECTURE)	ATTRIBUTE VALUES OF ATTRIBUTE #2 (CITY/TOWN)	ATTRIBUTE VALUES OF ATTRIBUTE #3 (SECTION)
TOKYO	MINATO	ROPPOGI
TOKYO	MINATO	AKASAKA
TOKYO	MINATO	SHIBA
TOKYO	MINATO	DAIBA
TOKYO	MINATO	;
TOKYO	MINATO	;
TOKYO	MINATO	;
TOKYO	MINATO	;
TOKYO	;	;
TOKYO	CHUOU	GINZA
TOKYO	CHUOU	NIHONBASHI
TOKYO	CHUOU	;
TOKYO	;	;
TOKYO	CHIYODA	;
TOKYO	CHIYODA	;
TOKYO	;	;
TOKYO	SUGINAMI	;
TOKYO	SUGINAMI	;
;	;	;
KANAGAWA	YOKOHAMA	ISOGO
KANAGAWA	YOKOHAMA	KANAZAWA
KANAGAWA	;	;
KANAGAWA	YOKOSUKA	HIKARINOOKA
KANAGAWA	;	NAGASAWA
KANAGAWA	CHIGASAKI	;
	;	;

**FIG.5**

OUTPUT ORDER	ATTRIBUTE VALUE (CITY/TOWN) CANDIDATE	RECOGNITION LIKELIHOOD
1	AMAGASAKI	970
2	CHUOU	900
3	YOKKAICHI	820
4	CHIYODA	710
.	.	.
.	.	.
50	YOKOHAMA	.
.	.	.
.	.	.
100	YOKOSUKA	14

DESCENDING  
ORDER OF  
RECOGNITION  
LIKELIHOOD

**THE UNIVERSITY OF CHICAGO**

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FIG.6

OUTPUT ORDER	ATTRIBUTE VALUE (CITY/TOWN) CANDIDATE	RECOGNITION LIKELIHOOD
1	CHIGASAKI	1,200
2	TAKASAKI	1,050
3	TAKAMATU	980
4	AMAGASAKI	970
.	.	.
10	YOKKAICHI	820
.	.	.
500	YOKOHAMA	.
.	.	.
.	.	.
2100	NAHA	2

DESCENDING  
ORDER OF  
RECOGNITION  
LIKELIHOOD

 CITY/TOWN CONTAINED IN  
NON-PRIORITIZED RECOGNITION TARGET WORDS



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FIG.8

OUTPUT ORDER	ATTRIBUTE CANDIDATE	ATTRIBUTE VALUE (CITY/TOWN)	RECOGNITION LIKELIHOOD	OUTPUT ORDER	RELATED ATTRIBUTE VALUE CANDIDATE	RECOGNITION LIKELIHOOD
1	CHIGASAKI	1,200	1,200	1	KAGAWA	1,020
2	TAKASAKI	1,050	1,050	2	KANAGAWA	1,000
3	TAKAMATSU	980	980	3	ISHIKAWA	910
4	AMAGASAKI	970	970	4	FUKUOKA	870
.	.	.	.	.	.	.
10	YOKKAICHI	820	820	.	.	.
.	.	.	.	.	.	.
500	YOKOHAMA	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
2100	NAHA	2	2	47	HOKKAIDO	34

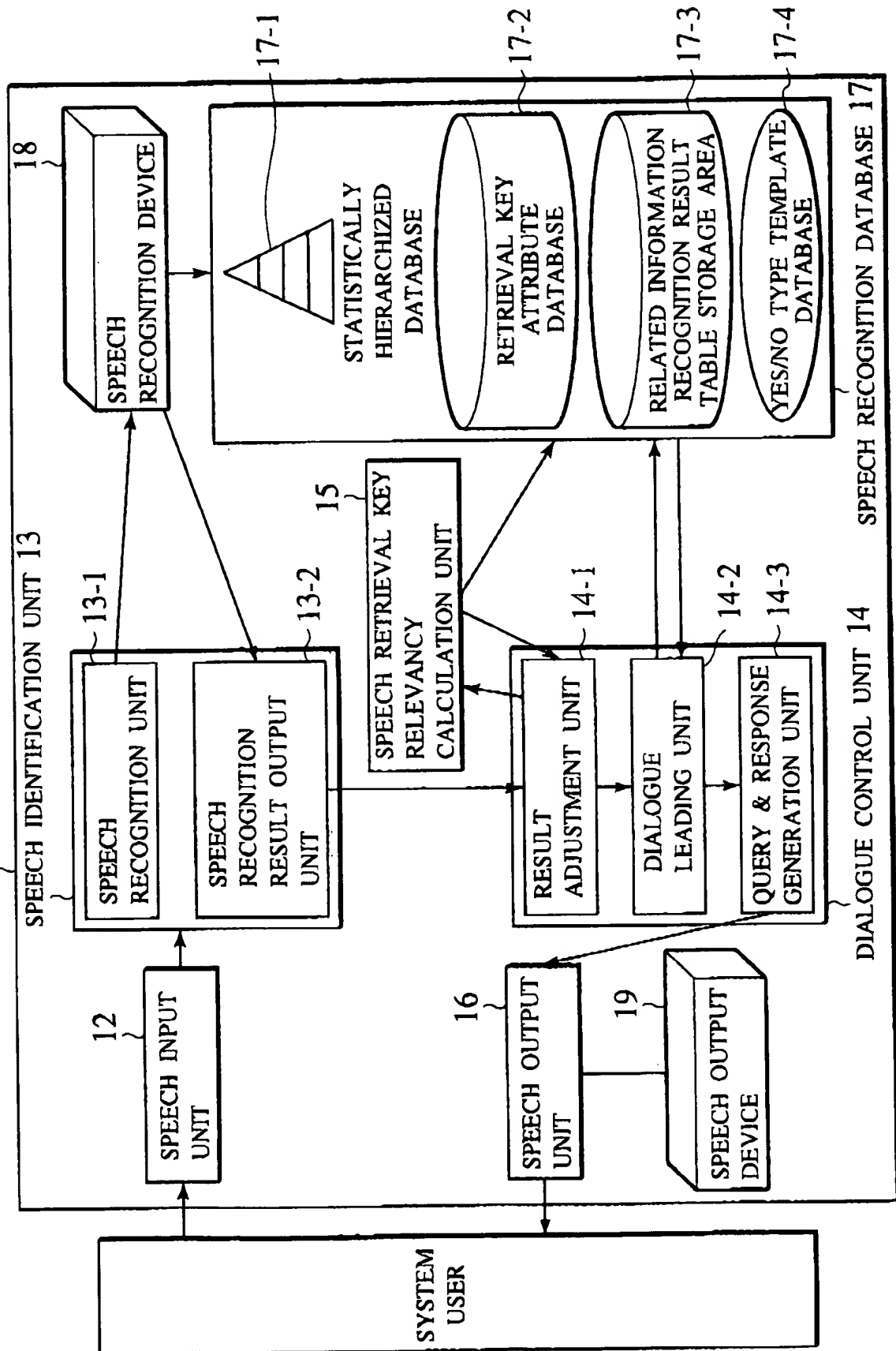
RELATED ATTRIBUTE VALUE  
RECOGNITION RESULT (FIG.5)

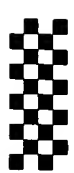
ATTRIBUTE VALUE RECOGNITION RESULT (FIG.4)

OUTPUT ORDER	ATTRIBUTE CANDIDATE	ATTRIBUTE VALUE (CITY/TOWN)	CROSS-CHECKED LIKELIHOOD
1	CHIGASAKI,KANAGAWA	1,200,000	1,200,000
2	TAKAMATSU,KAGAWA	1,071,000	1,071,000
3	KANAZAWA,ISHIKAWA	999,800	999,800
4	.	.	.
.	.	.	.
10	TAKASAKI,GUNMA	640,100	640,100
.	.	.	.
.	.	.	.
.	.	.	.
2100	NAHA,OKINAWA	80	80



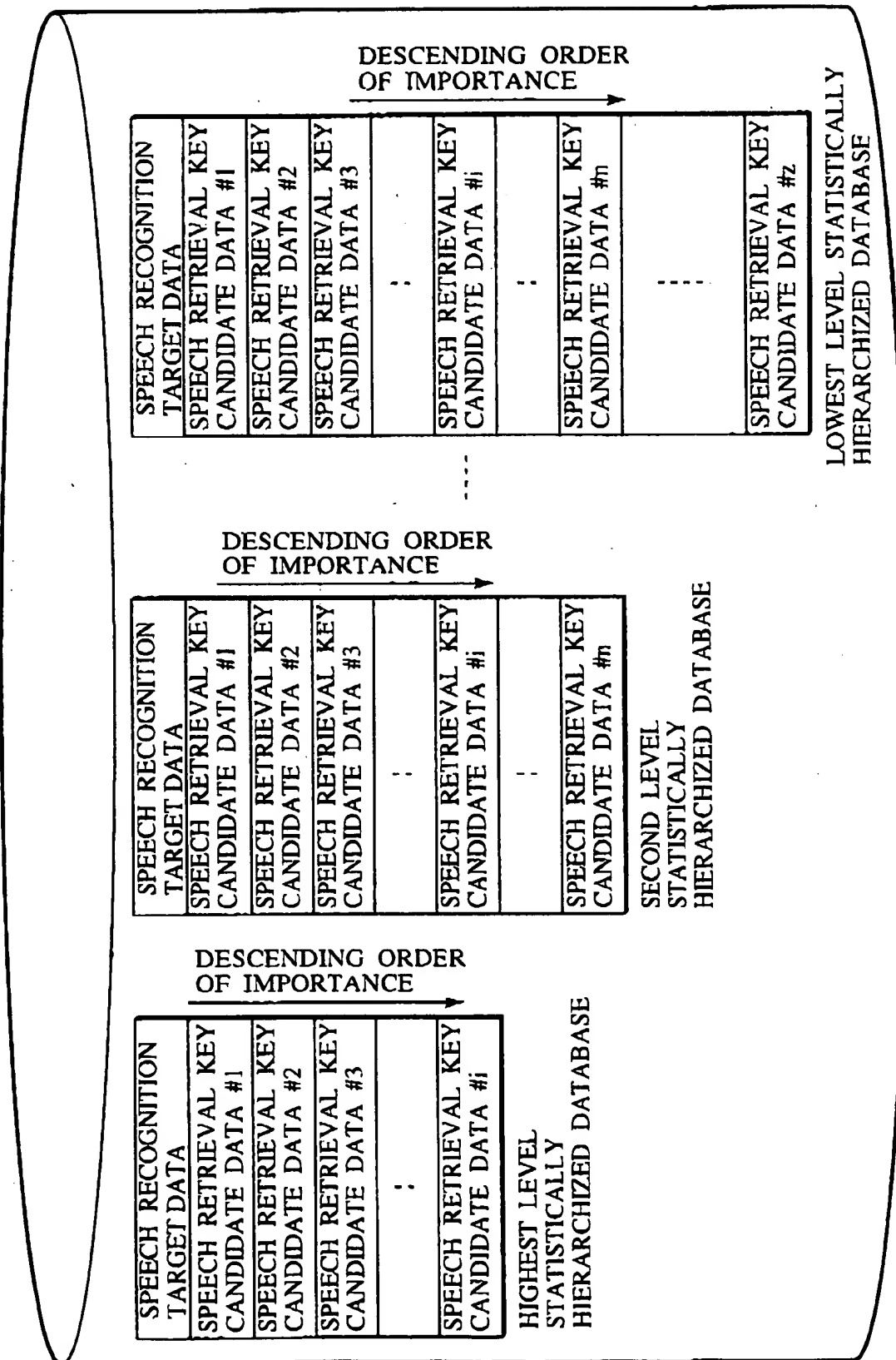
FIG.9  
SPEECH RECOGNITION BASED INTERACTIVE INFORMATION RETRIEVAL APPARATUS 11





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FIG.10



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FIG.11

DESCENDING ORDER  
OF RETRIEVAL KEY  
RECOGNITION LIKELIHOOD  
→

SPEECH RECOGNITION RESULT	RECOGNITION LIKELIHOOD
SPEECH RETRIEVAL KEY CANDIDATE #1	RETRIEVAL KEY RECOGNITION LIKELIHOOD OF RETRIEVAL KEY #1
SPEECH RETRIEVAL KEY CANDIDATE #2	RETRIEVAL KEY RECOGNITION LIKELIHOOD OF RETRIEVAL KEY #2
SPEECH RETRIEVAL KEY CANDIDATE #3	RETRIEVAL KEY RECOGNITION LIKELIHOOD OF RETRIEVAL KEY #3
:	:
SPEECH RETRIEVAL KEY CANDIDATE #i	RETRIEVAL KEY RECOGNITION LIKELIHOOD OF RETRIEVAL KEY #i

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FIG.12

	RELATED ATTRIBUTE #1	RELATED ATTRIBUTE #m
SPEECH RETRIEVAL KEY #1	RELATED ATTRIBUTE OF RETRIEVAL KEY #1	RELATED ATTRIBUTE OF RETRIEVAL KEY #1
SPEECH RETRIEVAL KEY #2	RELATED ATTRIBUTE OF RETRIEVAL KEY #2	RELATED ATTRIBUTE OF RETRIEVAL KEY #2
SPEECH RETRIEVAL KEY #3	RELATED ATTRIBUTE OF RETRIEVAL KEY #3	RELATED ATTRIBUTE OF RETRIEVAL KEY #3
.	.	.
SPEECH RETRIEVAL KEY #i	RELATED ATTRIBUTE OF RETRIEVAL KEY #i	RELATED ATTRIBUTE OF RETRIEVAL KEY #i
.	.	.
.	.	.
SPEECH RETRIEVAL KEY #n	RELATED ATTRIBUTE OF RETRIEVAL KEY #n	RELATED ATTRIBUTE OF RETRIEVAL KEY #n
.	.	.
.	.	.
.	.	.
SPEECH RETRIEVAL KEY #z	RELATED ATTRIBUTE OF RETRIEVAL KEY #z	RELATED ATTRIBUTE OF RETRIEVAL KEY #z

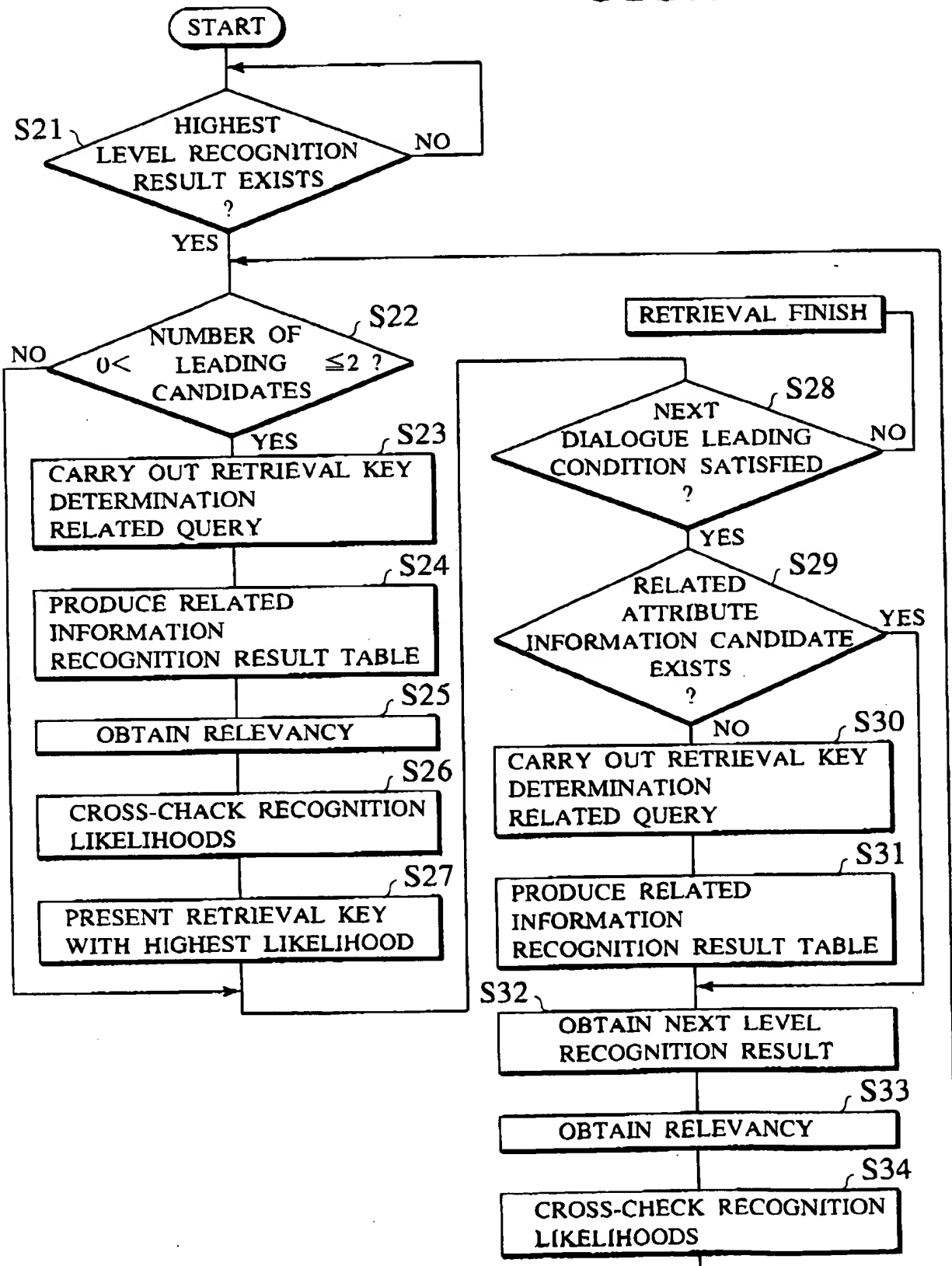
DESCENDING ORDER OF  
RELATED INFORMATION  
RECOGNITION LIKELIHOOD

ATTRIBUTE INFORMATION	RELATED INFORMATION RECOGNITION LIKELIHOOD
RELATED INFORMATION CANDIDATE #1	RECOGNITION LIKELIHOOD OF RELATED INFORMATION CANDIDATE #1
RELATED INFORMATION CANDIDATE #2	RECOGNITION LIKELIHOOD OF RELATED INFORMATION CANDIDATE #2
RELATED INFORMATION CANDIDATE #3	RECOGNITION LIKELIHOOD OF RELATED INFORMATION CANDIDATE #3
.	.
.	.
RELATED INFORMATION CANDIDATE #n	RECOGNITION LIKELIHOOD OF RELATED INFORMATION CANDIDATE #n
.	.
.	.
.	.
RELATED INFORMATION CANDIDATE #z	RECOGNITION LIKELIHOOD OF RELATED INFORMATION CANDIDATE #z

# FIG.13

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FIG.14



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FIG.15

	1ST LEVEL	2ND LEVEL	3RD LEVEL	4TH LEVEL
1	BERLIN PHILHARMONIC	BERLIN PHILHARMONIC	BERLIN PHILHARMONIC	BERLIN PHILHARMONIC
2	VIENNA PHILHARMONIC	VIENNA PHILHARMONIC	VIENNA PHILHARMONIC	VIENNA PHILHARMONIC
3	NEW YORK PHILHARMONIC	NEW YORK PHILHARMONIC	NEW YORK PHILHARMONIC	NEW YORK PHILHARMONIC
4	LONDON SYMPHONY	LONDON SYMPHONY	LONDON SYMPHONY	LONDON SYMPHONY
5	CHICAGO SYMPHONY	CHICAGO SYMPHONY	CHICAGO SYMPHONY	CHICAGO SYMPHONY
6	BOSTON SYMPHONY	BOSTON SYMPHONY	BOSTON SYMPHONY	BOSTON SYMPHONY
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
59	VIENNA STATE OPERA	VIENNA STATE OPERA	VIENNA STATE OPERA	VIENNA STATE OPERA
60	METROPOLITAN OPERA	METROPOLITAN OPERA	METROPOLITAN OPERA	METROPOLITAN OPERA
.		.	.	.
.		.	.	.
.		.	.	.
90		GUSTAV LEONHARDT	GUSTAV LEONHARDT	GUSTAV LEONHARDT
.		.	.	.
149		HESPERION XX	HESPERION XX	HESPERION XX
150		CONSORT OF MUSICKE	CONSORT OF MUSICKE	CONSORT OF MUSICKE
.		.	.	.
.		.	.	.
.		.	.	.
.		.	.	.
.		.	.	.
249			SEQUENTIA	SEQUENTIA
250			HUEL GAS ENSEMBLE	HUEL GAS ENSEMBLE
.			.	.
.			.	.
.			.	.
.			.	.
350				LONDON SINFONIETTA

[illegible]

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FIG.16

	SPEECH RETRIEVAL KEY CANDIDATE	RECOGNITION LIKELIHOOD	NORMALIZED LIKELIHOOD
1	LONDON SYMPHONY	4,500	0.0375
2	BOSTON SYMPHONY	4,300	0.0358
3	NEW YORK PHILHARMONIC	3,900	0.0325
4	VIENNA STATE OPERA	3,700	0.0308
5	METROPOLITAN OPERA	3,700	0.0308
6	CHICAGO SYMPHONY	3,400	0.0283
.	.	.	.
.	.	.	.
60	PHILHARMONIA ORCHESTRA	1,600	0.0133
TOTAL		120,000	1.0000

DESCENDING  
ORDER OF RETRIEVAL  
KEY RECOGNITION  
LIKELIHOOD



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FIG.17

	RETRIEVAL KEY CANDIDATE	DATE	PLACE	DAY OF WEEK	PREFECTURE	STYLE
1	BERLIN PHILHARMONIC	APRIL 12	OPERA CITY	MON	TOKYO	ORCHESTRA
2	VIENNA PHILHARMONIC	MAY 30	SYMPHONY HALL	SUN	OSAKA	ORCHESTRA
3	NEW YORK PHILHARMONIC	APRIL 3	OPERA CITY	SAT	TOKYO	ORCHESTRA
4	LONDON SYMPHONY	MAY 30	SYMPHONY HALL	SUN	OSAKA	ORCHESTRA
5	CHICAGO SYMPHONY	APRIL 20	SUNTORY HALL	TUE	TOKYO	ORCHESTRA
6	BOSTON SYMPHONY	APRIL 10	OPERA CITY	SAT	TOKYO	ORCHESTRA
.	.	.	.	.	.	.
.	.	.	.	.	.	.
59	VIENNA STATE OPERA	APRIL 20	NHK HALL	TUE	TOKYO	OPERA
60	METROPOLITAN OPERA	APRIL 21	NHK HALL	WED	TOKYO	OPERA
.	.	.	.	.	.	.
.	.	.	.	.	.	.
90	GUSTAV LEONHARDT	MARCH 3	CASALS HALL	WED	TOKYO	BAROQUE
.	.	.	.	.	.	.
149	HESPERION XX	MARCH 30	FESTIVAL HALL	TUE	OSAKA	BAROQUE
150	CONSORT OF MUSICKE	APRIL 10	SUNTORY HALL	SAT	TOKYO	BAROQUE
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
249	SEQUENTIA	APRIL 2	ORCHARD HALL	FRI	TOKYO	RENAISSANCE
250	HUEL GAS ENSEMBLE	APRIL 21	TOKYO CATHEDRAL	WED	TOKYO	RENAISSANCE
.	.	.	.	.	.	.
.	.	.	.	.	.	.
350	LONDON SINFONIETTA	MARCH 3	FESTIVAL HALL	WED	OSAKA	CONTEMPORARY

00050-026500





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FIG.20

RETRIEVAL KEY  
ATTRIBUTE DATABASE

	SPEECH RETRIEVAL KEY CANDIDATE	RECOGNITION LIKELIHOOD	NORMALIZED LIKELIHOOD
1	HESPERION XX	4,200	0.0080
2	CONSORT OF MUSICKE	4,020	0.0077
3	LONDON SYMPHONY	3,900	0.0074
4	GUSTAV LEONHARDT	3,800	0.0072
5	BOSTON SYMPHONY	3,500	0.0067
6	CHICAGO SYMPHONY	2,800	0.0053
.	.	.	.
.	.	.	.
60	ENSEMBLE ORGANUM	1,900	0.0036
.	.	.	.
.	.	.	.
150	GOTHIC VOICES	240	0.0004
		525,000	1.0000

SPEECH RECOGNITION RESULT TABLE FOR  
SECOND STATISTICALLY HIERARCHIZED DATABASE

	ATTRIBUTE INFORMATION CANDIDATE	RELATED INFORMATION LIKELIHOOD	NORMALIZED LIKELIHOOD
1	MARCH 5	5,600	0.0102
2	MARCH 10	5,400	0.0098
3	MARCH 5	4,800	0.0090
4	APRIL 10	4,400	0.0080
5	MARCH 3	4,200	0.0077
6	APRIL 3	3,500	0.0064
7	MARCH 30	3,000	0.0055
.	.	.	.
.	.	.	.
61	MARCH 31	1,100	0.0020
TOTAL	.	549,000	1.0000

RELATED INFORMATION RECOGNITION  
RESULT TABLE

	NEW RECOGNITION LIKELIHOOD	NORMALIZED NEW LIKELIHOOD	RENEWED LIKELIHOOD THRESHOLD
1	0.000062	0.2897	
2	0.000056	0.2593	
3	0.000054	0.2523	
4	0.000044	0.2056	
5	0.000000	0.0000	
	0.000216	1.0000	

INITIAL LIKELIHOOD THRESHOLD



FIG.22

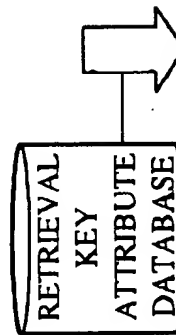
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SPEECH RECOGNITION RESULT		NEW RECOGNITION LIKELIHOOD	NORMALIZED NEW LIKELIHOOD	LIKELIHOOD THRESHOLD	
1	CONSORT OF MUSICKE	0.000062	0.2897		
2	GUSTAV LEONHARDT	0.000056	0.2593		
3	BOSTON SYMPHONY	0.000054	0.2523		
4	HESPERION XX	0.000044	0.2056		
5	LONDON SYMPHONY	0.000000	0.0000		
		0.000216	1.0000		

RESULT OF CROSS-CHECKING SECOND LEVEL  
SPEECH RECOGNITION RESULT & CONCERT DATE

ATTRIBUTE INFORMATION CANDIDATE	RELATED INFORMATION LIKELIHOOD	NORMALIZED LIKELIHOOD
1 CASALS HALL	4,200	0.0833
2 CRCHARD HALL	3,900	0.0774
3 FESTIVAL HALL	3,700	0.0734
4 SYMPHONY HALL	2,200	0.0436
5 NHK HALL	2,000	0.0397
6 SUNTORY HALL	2,000	0.0397
.	.	.
.	.	.
40 OPERA CITY	1,400	0.0278
	50,400	1.0000

PLACE AS RELATED INFORMATION  
RECOGNITION RESULT TABLE



	SPEECH RECOGNITION RESULT	NEW RECOGNITION LIKELIHOOD	NORMALIZED NEW LIKELIHOOD
1	GUSTAV LEONHARDT	0.02160	0.6123
2	CONSORT OF MUSICKE	0.01150	0.3260

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FIG.23

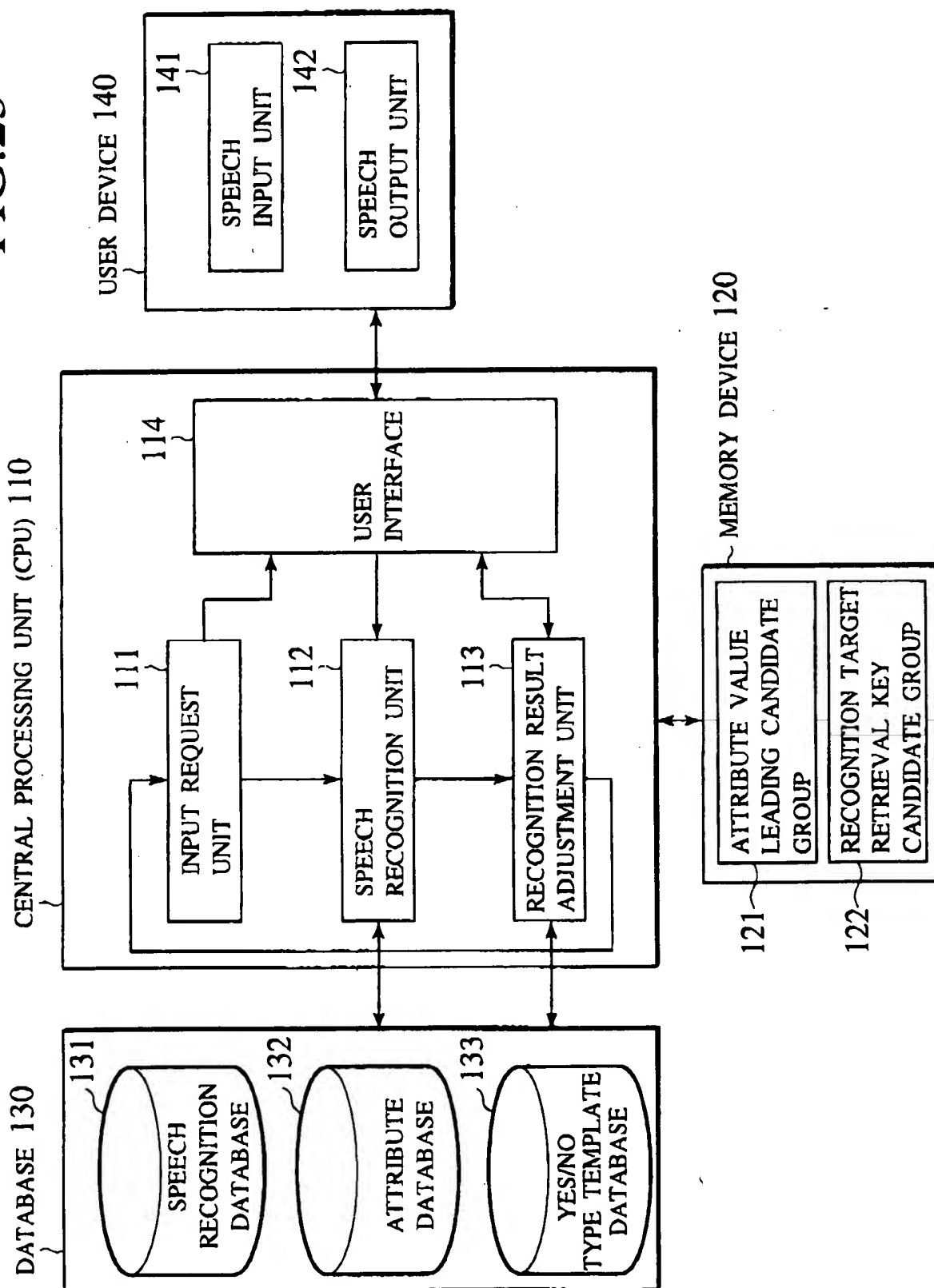


FIG. 24

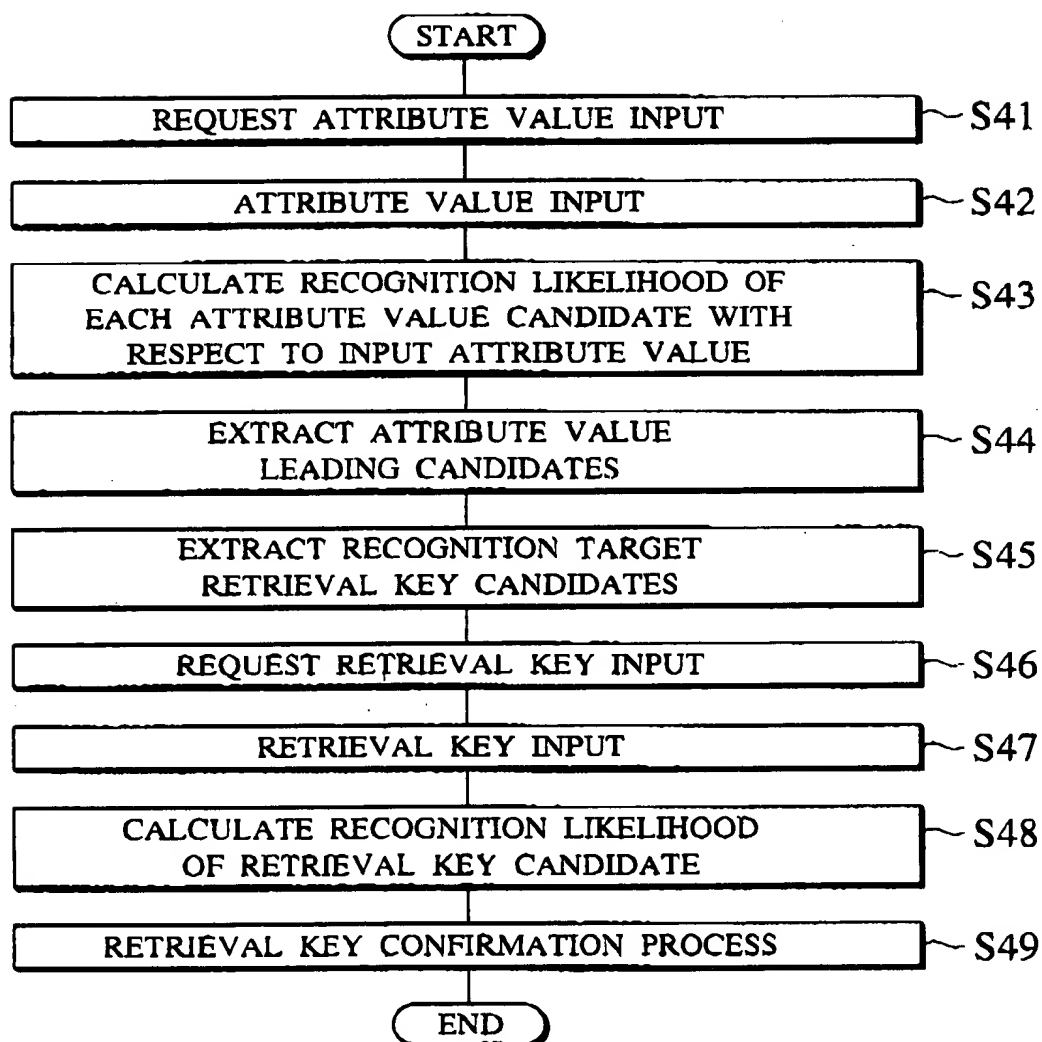
RETRIEVAL KEY CANDIDATE	ATTRIBUTE ITEM #1	ATTRIBUTE ITEM #2	.	.	ATTRIBUTE ITEM #n
RETRIEVAL KEY #1	ATTRIBUTE VALUE #1-10	ATTRIBUTE VALUE #2-2	.	.	ATTRIBUTE VALUE #n-11
RETRIEVAL KEY #2	ATTRIBUTE VALUE #1-2	ATTRIBUTE VALUE #2-9	.	.	ATTRIBUTE VALUE #n-1
RETRIEVAL KEY #3	ATTRIBUTE VALUE #1-k	ATTRIBUTE VALUE #2-12	.	.	ATTRIBUTE VALUE #n-k
.	.	.	.	.	.
.	.	.	.	.	.
RETRIEVAL KEY #k	ATTRIBUTE VALUE #1-5	ATTRIBUTE VALUE #2-21	.	.	ATTRIBUTE VALUE #n-3

FIG. 25

ATTRIBUTE ITEM #1	ATTRIBUTE ITEM #2	.	.	ATTRIBUTE ITEM #n
ATTRIBUTE VALUE CANDIDATE #1-1	ATTRIBUTE VALUE CANDIDATE #2-1	.	.	ATTRIBUTE VALUE CANDIDATE #n-1
ATTRIBUTE VALUE CANDIDATE #1-2	ATTRIBUTE VALUE CANDIDATE #2-2	.	.	ATTRIBUTE VALUE CANDIDATE #n-2
ATTRIBUTE VALUE CANDIDATE #1-3	ATTRIBUTE VALUE CANDIDATE #2-3	.	.	ATTRIBUTE VALUE CANDIDATE #n-3
.	.	.	.	.
.	.	.	.	.
ATTRIBUTE VALUE CANDIDATE #1-k	ATTRIBUTE VALUE CANDIDATE #2-k	.	.	ATTRIBUTE VALUE CANDIDATE #n-k



FIG. 26





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FIG.29

ORDER	ATTRIBUTE VALUE CANDIDATE	RECOGNITION LIKELIHOOD
1ST	KAGAWA	0.945
2ND	KANAGAWA	0.899
3RD	ISHIKAWA	0.783
.	.	.
.	.	.
.	.	.
47TH	FUKUI	0.212

FIG.30

RECOGNITION TARGET CITY/TOWN	ATTRIBUTE VALUE
YOKOHAMA	KANAGAWA
YOKOSUKA	KANAGAWA
KAWASAKI	KANAGAWA
KAMAKURA	KANAGAWA
.	KANAGAWA
.	.
.	.
.	.
KAGAWA	KAGAWA
TAKAMATSU	KAGAWA
SAKAIDE	KAGAWA
KOTOHIRA	KAGAWA
.	.

189 RETRIEVAL KEY  
CANDIDATES SELECTED

000000-000000

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FIG.31

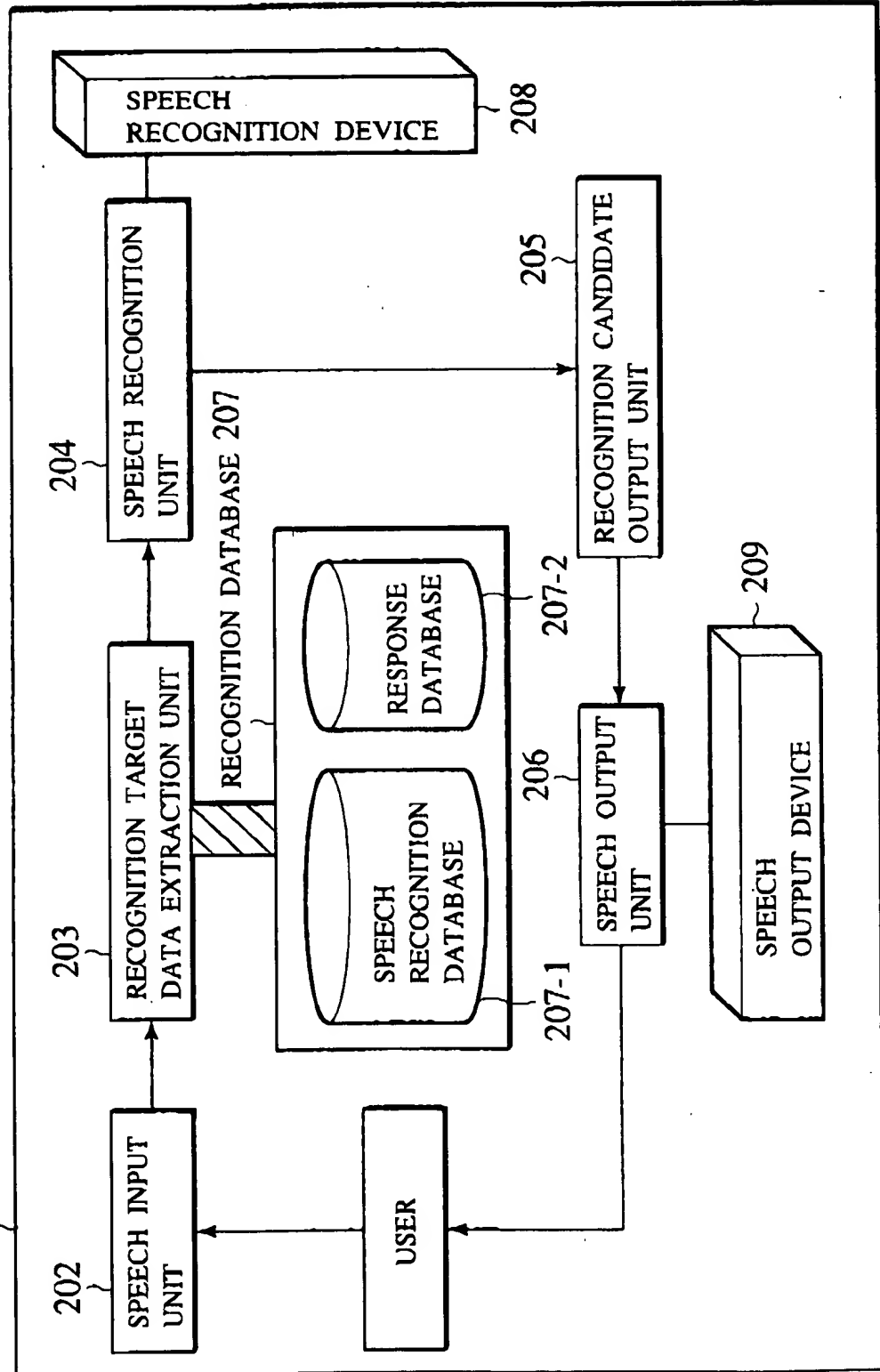
ORDER	RETRIEVAL KEY CANDIDATE	RECOGNITION LIKELIHOOD
1ST	YOKOHAMA	0.892
2ND	YOKOSUKA	0.812
3RD	SAKAIDE	0.783
.	.	.
.	.	.
.	.	.
189TH	KOTOHIRA	0.108

000050-0722560

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FIG.32

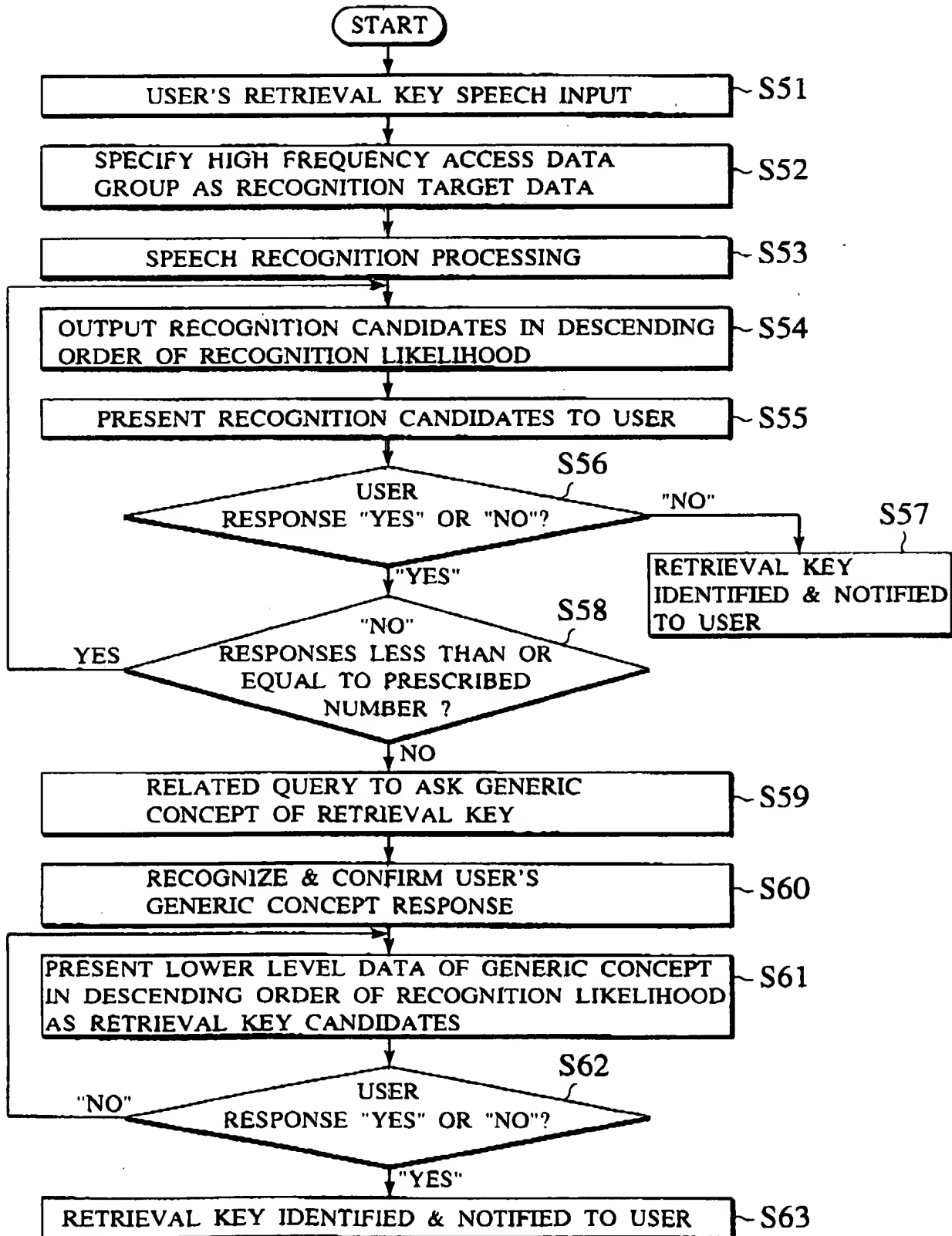
SPEECH RECOGNITION BASED INTERACTIVE INFORMATION RETRIEVAL APPARATUS 201





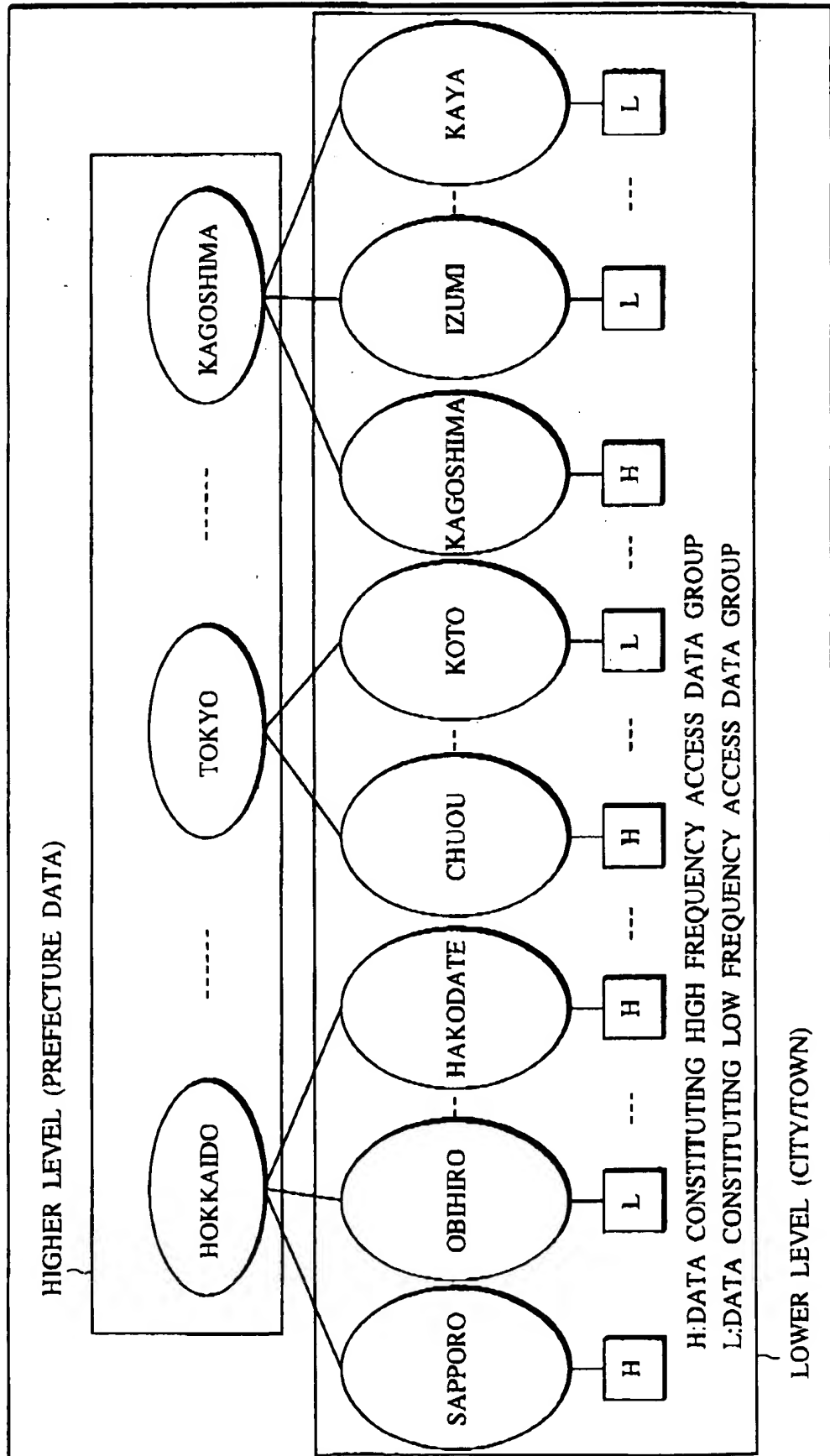
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## FIG.34



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FIG.35








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FIG.37

ORDER	CITY/TOWN
1ST	YOKOSUKA
2ND	YOKOHAMA
3RD	YOTSUGI
4TH	MAIHAMA
.	.
.	.
50TH	MINATO

DESCENDING  
ORDER OF  
RECOGNITION  
LIKELIHOOD



00503219-052000

FIG.38

ORDER	CITY/TOWN
1ST	YOKOHAMA
2ND	YOKOSUKA
3RD	YOKOYAMA
4TH	MIHAMA
.	.
.	.
50TH	CHIBA

DESCENDING  
ORDER OF  
RECOGNITION  
LIKELIHOOD


Case	Age	Sex	Duration	Location	Findings
1	25	M	10 years	Left eye	Small, dark, pigmented lesion
2	35	F	5 years	Right eye	Large, light-colored, pigmented lesion
3	45	M	15 years	Left eye	Small, dark, pigmented lesion
4	55	F	20 years	Right eye	Large, light-colored, pigmented lesion
5	65	M	25 years	Left eye	Small, dark, pigmented lesion
6	75	F	30 years	Right eye	Large, light-colored, pigmented lesion
7	85	M	35 years	Left eye	Small, dark, pigmented lesion
8	95	F	40 years	Right eye	Large, light-colored, pigmented lesion

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FIG.39

ORDER	CITY/TOWN
1ST	YOKOKAWA
2ND	TAKASAKI
3RD	MAEHASHI
.	.
.	.
.	.
41TH	KIRYU

DESCENDING  
ORDER OF  
RECOGNITION  
LIKELIHOOD



000050-0722500